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10/650,271	08/28/2003	Haitao Zhang	020305	6603

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QUALCOMM INCORPORATED
5775 MOREHOUSE DR.
SAN DIEGO, CA 92121

EXAMINER	
AHN, SAM K	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 11/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,271	ZHANG, HAITAO	
	Examiner	Art Unit	
	Sam K. Ahn	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12,30 and 48* is/are rejected.

7)☒ Claim(s) *1-11,13-29,31-47 and 49-54* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *030705*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-54 are objected to because of the following informalities:

In claim 1, line 5, "less than" should be "and less than", line 11, "the communication" should be "a communication", and the variables k, d_m, Λ, N and M should be defined in the claim.

In claim 15, line 2, "(A(n-i)" should be "A(n-i)".

In claim 19, line 6, "less than" should be "and less than", line 11, "the communication" should be "a communication", and the variables k, d_m, Λ, N and M should be defined in the claim.

In claim 30, line 1, "the step of filtering" should be " a filter f", line 2, "a filter f for filtering" should be "the filter f".

In claim 33, line 2, "(A(n-i)" should be "A(n-i)".

In claim 37, line 6, "less than" should be "and less than", line 11, "the communication" should be "a communication", and the variables k, d_m, Λ, N and M should be defined in the claim.

In claim 48, line 1, "the step of filtering" should be " a filter f", line 2, "a filter f for filtering" should be "the filter f".

In claim 51, line 2, "(A(n-i)" should be "A(n-i)".

Claims 2-14,16-18,20-29,31,32,34-36,38-,47,49,50 and 52-54 directly or indirectly depend on claim 1,19 or 37. Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 12,30 and 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 9,28 and 47 of copending Application No. 10/650,272 (hereinafter, '272).

Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one skilled in the art at the time the invention was made.

3. Regarding claim 12,

a. the claim recites

A method of estimating a communication channel impulse response h(t) comprising the steps of:

which is also recited in claim 9 of '272,

A method of estimating a communication channel impulse response h(t) comprising the steps of:

hence both the instant application and '272 recite the same method.

b. Claim 12 further recites

generating a data sequence d_i having a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$;

wherein claim 9 of '272 recites,

wherein the data sequence d_i includes a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$.

Although '272 does not explicitly teach that the data sequence is generated by a generating step, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the data sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

c. Claim 12 also recites

generating a chip sequence c_j having a chip period T_c as the data sequence d_i spread by a spreading sequence S_i of length N;

wherein claim 9 of '272 recites,

generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with **a spreading sequence S_i of length N**, wherein the received signal r(t) comprises **a chip sequence c_j** applied to a communication channel characterizable by an impulse response h(t), and wherein the chip sequence c_j is generated from a **data sequence d_i spread by the spreading sequence S_i** and wherein **T_c is the chip period of the chip sequence c_j**; wherein the common limitations are emphasized. Thus, one skilled in the art at the time the invention was made would recognize that the difference is merely wording of the claim language as the limitation of claim 12 of is fully recited in '272.

And although '272 does not explicitly teach that the chip sequence is generated by a generating step, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the chip sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

d. Claim 12 further recites,

generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with the spreading sequence S_i, wherein the received signal r(t) comprises the chip sequence c_j applied to the communication channel;

wherein claim 9 of '272 recites,

generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with a spreading sequence S_i of length N, **wherein the received signal r(t) comprises a chip sequence c_j applied to a communication channel...**

wherein the common limitations are emphasized, hence both the instant application and '272 recite the same limitation.

e. And claim 12 recites,

generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

wherein claim 9 of '272 recites,

generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

hence, both the instant application and '272 recite the same limitation.

f. And finally, claim 12 recites,

step of filtering the estimated communication channel impulse response $h_M(t)$ with a filter f selected at least in part according to the spreading sequence S_i

wherein claim 9 of '272 recites,

filtering the first estimated communication channel impulse response $h_M(t)$ to generate the estimated communication channel impulse response h(t) with a filter f selected at least in part according to the spreading sequence S_i

wherein the "the estimated communication channel impulse response" of the instant application and "the first estimated communication channel impulse response" of '272 are both referring to the same $h_M(t)$, hence are equivalent. And although '272 recites that through the filtering step h(t) is generated, one skilled in the art at the time the invention was made would recognize that any filtering step, including the filtering step of the instant application and of '272, involves filtering an input signal to produce an output signal, which is well-known to one skilled in the art, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that both the instant application and '272 filtering step would produce an output signal, or the h(t) as claimed, which is well-known to one skilled in the art.

And further, although instant application recites separate steps of generating a data sequence, generating a chip sequence, and generating $co_m(t)=co(t+mNT_c)$, while '272 recites generating step of $co_m(t)=co(t+mNT_c)$ only, while fully reciting the data sequence and the chip sequence, one skilled in the art at the time the invention was made would recognize that the data sequence and the chip sequence generated

was produced by a transmitter while the generating step of $co_m(t)=co(t+mNT_c)$ is performed at the receiver. Since claim 9 of '272 recites the characteristics of the data sequence and of the chip sequence, the result in the step of $co_m(t)=co(t+mNT_c)$ of '272 and of the instant application would be equivalent. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that '272 and of the instant application are not patentably distinct from each other resulting in the step of $co_m(t)=co(t+mNT_c)$.

4. Regarding claim 30,

a. the claim recites,

An apparatus for estimating a communication channel impulse response h(t), comprising:

which is also recited in claim 28 of '272,

An apparatus for estimating a communication channel impulse response h(t), comprising:

hence, both the instant application and '272 recite the same limitation;

b. claim 30 further recites

means for generating a data sequence d_i having a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$;

wherein claim 28 of '272 recites,

wherein the data sequence d_i includes a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$.

Although '272 does not explicitly teach that the data sequence is generated, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the data sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

c. Claim 30 also recites

means for generating a chip sequence c_j having a chip period T_c as the data sequence d_i spread by a spreading sequence S_i of length N;

wherein claim 28 of '272 recites,

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with **a spreading sequence S_i of length N**, wherein the received signal r(t) comprises **a chip sequence c_j** applied to a communication channel characterizable by an impulse response h(t), and wherein the chip sequence c_j is generated from a **data sequence d_i spread by the spreading sequence S_i** and wherein **T_c is the chip period of the chip sequence c_j**;

wherein the common limitations are emphasized. Thus, one skilled in the art at the time the invention was made would recognize that the difference is merely wording of the claim language as the limitation of claim 12 of is fully recited in '272.

And although '272 does not explicitly teach that the chip sequence is generated, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the chip sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

d. Claim 30 further recites,

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with the spreading sequence S_i, wherein the received signal r(t) comprises the chip sequence c_j applied to the communication channel;

wherein claim 28 of '272 recites,

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with a spreading sequence S_i of length N, **wherein the received signal r(t) comprises a chip sequence c_j applied to a communication channel...**

wherein the common limitations are emphasized, hence, both the instant application and '272 recite the same limitation.

e. And claim 30 recites,

means for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

wherein claim 9 of '272 recites,

means for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

hence, both the instant application and '272 recite the same limitation.

f. And finally, claim 30 recites,

step of filtering the estimated communication channel impulse response $h_M(t)$ with a filter f selected at least in part according to the spreading sequence S_i

wherein claim 9 of '272 recites,

a filter means f, selected at least in part according to the spreading sequence S_i, the filter means for filtering the first estimated communication channel impulse response $h_M(t)$ to generate the estimated communication channel impulse response h(t) with

wherein under "Claim objection" suggestion was made in order to fully recite an apparatus type claim, note above, the "the estimated communication channel impulse response" of the instant application and "the first estimated communication channel impulse response" of '272 are both referring to the same $h_M(t)$, hence are equivalent. And although '272 recites that through the filter means, the h(t) is

generated, one skilled in the art at the time the invention was made would recognize that any filtering means, including the filter means of the instant application and of '272, involves filtering an input signal to produce an output signal, which is well-known to one skilled in the art, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that both the instant application and '272 filtering step would produce an output signal, or the h(t) as claimed, which is well-known to one skilled in the art.

And further, although instant application recites separate means for generating a data sequence, generating a chip sequence, and generating $co_m(t)=co(t+mNT_c)$, while '272 recites generating step of $co_m(t)=co(t+mNT_c)$ only, while fully reciting the data sequence and the chip sequence, one skilled in the art at the time the invention was made would recognize that the data sequence and the chip sequence generated was produced by a transmitter while the means for generating $co_m(t)=co(t+mNT_c)$ is performed at the receiver. Since claim 9 of '272 recites the characteristics of the data sequence and of the chip sequence, the result in the step of $co_m(t)=co(t+mNT_c)$ of '272 and of the instant application would be equivalent. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that '272 and of the instant application are not patentably distinct from each other resulting in the step of $co_m(t)=co(t+mNT_c)$.

5. Regarding claim 48,

a. the claim recites,

An apparatus for estimating a communication channel impulse response h(t), comprising:

which is also recited in claim 47 of '272,

An apparatus for estimating a communication channel impulse response h(t), comprising:

hence, both the instant application and '272 recite the same limitation.

b. claim 48 further recites

means for generating a data sequence d_i having a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$;

wherein claim 47 of '272 recites,

wherein the data sequence d_i includes a constrained portion Cd_i associated with at least two codes w_0, w_1, wherein a correlation $A_{code}(k)$ of the constrained portion Cd_i with one of the codes w_0, w_1, is characterized by a maximum value at k=0 less than maximum values at $k \neq 0$.

Although '272 does not explicitly teach that the data sequence is generated, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the data sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant

application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

c. Claim 48 also recites

means for generating a chip sequence c_j having a chip period T_c as the data sequence d_i spread by a spreading sequence S_i of length N;

wherein claim 47 of '272 recites,

means for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with **a spreading sequence S_i of length N**, wherein the received signal r(t) comprises **a chip sequence c_j** applied to a communication channel characterizable by an impulse response h(t), and wherein the chip sequence c_j is generated from a **data sequence d_i spread by the spreading sequence S_i** and wherein **T_c is the chip period of the chip sequence c_j**;

wherein the common limitations are emphasized.

Although '272 does not explicitly teach that the chip sequence is generated, it is well-known to one skilled in the art at the time the invention was made to recognize that any signal including the chip sequence of the present application are produced by generating, as any signal cannot simply be present without a step of generating. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that generating a data sequence of the instant application is well-known to one skilled in the art as any signal cannot be simply present without a step of generating.

Thus, one skilled in the art at the time the invention was made would recognize that the difference is merely wording of the claim language as the limitation of claim 12 of is fully recited in '272.

d. Claim 48 further recites,

a correlator for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with the spreading sequence S_i, wherein the received signal r(t) comprises the chip sequence c_j applied to the communication channel;

wherein claim 47 of '272 recites,

a correlator for generating $co_m(t)=co(t+mNT_c)$ for m=0, 1, Λ, M by correlating a received signal r(t) with a spreading sequence S_i of length N, **wherein the received signal r(t) comprises a chip sequence c_j applied to a communication channel...**

wherein the common limitations are emphasized, hence, both the instant application and '272 recite the same limitation.

e. And claim 48 recites,

an estimator for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

wherein claim 47 of '272 recites,

an estimator for generating an estimated communication channel impulse response $h_M(t)$ as a combination of $co_m(t)$ and d_m for m=0, 1, Λ, M

hence, both the instant application and '272 recite the same limitation.

f. And finally, claim 48 recites,

step of filtering the estimated communication channel impulse response $h_M(t)$ with a filter f selected at least in part according to the spreading sequence S_i

wherein claim 47 of '272 recites,

a filter f, selected at least in part according to the spreading sequence S_i, the filter means for filtering the first estimated communication channel impulse response $h_M(t)$ to generate the estimated communication channel impulse response h(t),

wherein under "Claim objection" suggestion was made in order to fully recite an apparatus type claim, note above, wherein the "the estimated communication channel impulse response" of the instant application and "the first estimated communication channel impulse response" of '272 are both referring to the same $h_M(t)$, hence are equivalent. And although '272 recites that through the filter, the h(t) is generated, one skilled in the art at the time the invention was made would recognize that any filter, including the filter of the instant application and of '272, involves filtering an input signal to produce an output signal, which is well-known to one skilled in the art, and therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that both the instant application and '272 filtering step would produce an output signal, or the h(t) as claimed, which is well-known to one skilled in the art.

And further, although instant application recites separate means for generating a data sequence, generating a chip sequence, and generating $co_m(t)=co(t+mNT_c)$,

while '272 recites generating step of $co_m(t)=co(t+mNT_c)$ only, while fully reciting the data sequence and the chip sequence, one skilled in the art at the time the invention was made would recognize that the data sequence and the chip sequence generated was produced by a transmitter while the means for generating $co_m(t)=co(t+mNT_c)$ is performed at the receiver. Since claim 9 of '272 recites the characteristics of the data sequence and of the chip sequence, the result in the step of $co_m(t)=co(t+mNT_c)$ of '272 and of the instant application would be equivalent. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that '272 and of the instant application are not patentably distinct from each other resulting in the step of $co_m(t)=co(t+mNT_c)$. This is a provisional obviousness-type double patenting rejection.

Allowable Subject Matter

6. Claims 1-11,13-29,31-47 and 49-54 would be allowable if rewritten or amended to overcome the claim objections, set forth in this Office action.
7. Claims 12,30 and 48 would be allowable if rewritten or amended to overcome the claim objections, and Double Patenting, set forth in this Office action.
8. The following is a statement of reasons for the indication of allowable subject matter: present application discloses a method and apparatus for estimating a channel impulse response of a signal received via a communication channel wherein transmitted signal spreaded by a chip sequence is correlated at a receiver. Prior art teaches the limitations above, but do not explicitly teach the combination of

generating a data sequence having a portion wherein the portion has a characteristic that a correlation of the portion with one of associated codes provides maximum value at k is zero and less than the maximum value when k is not equal to zero, and generating estimated channel impulse response of combination of $co_m(t) = co(t + mNTc)$ and received data sequence, as claimed in claims 1,19 and 37.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bar-David et al. US 5,623,511 teach estimation of channel impulse response in a wireless environment wherein the signal is spreaded by Barker code.

Ibrahim et al. US 2004/0052306 A1 teach a receiver comprising channel estimation coupled to a matched filter and channel matched filter.

Webster et al. US 6,661,857 B1 teach a wireless receiver comprising channel estimator.

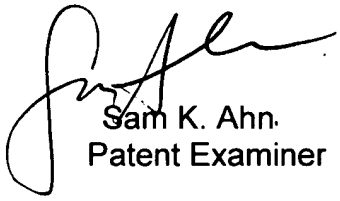
Buehrer et al. US 2003/0081656 A1 teach CDMA system transmitting data sequence spreaded by Walsh codes.

Komulainen et al. US 6,721,293 B1 teach CDMA system implementing different Walsh codes for different mobile stations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sam K. Ahn
Patent Examiner

11/16/06